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LOCOMOTIVE DIESEL ENGINE TURBOCHARGER AND TURBINE
STAGE CONSTRUCTED WITH TURBINE BLADE VIBRATION
SUPPRESSION METHODOLOGY

ABSTRACT OF THE DISCLOSURE

A method for fabrication of a locomotive diesel engine turbocharger turbine stage so as to avoid harmonic vibration in the turbine blades when the engine is operated at pre-selected throttle settings. Upon

5 determining throttle settings for the engine and modeling of the turbocharger therefor, at least one natural vibration frequency of the turbine blades and a turbine nozzle vane excitation frequency as a function of turbocharger rotation speed are determined. Then the data obtained is analyzed to ascertain whether at least one data coincidence, that is whether a rotation

10 speed correlative of a throttle setting has a coincidence over a predetermined range of both a natural frequency and said turbine vane nozzle excitation. If not, the model is suitable for fabrication of the turbocharger; if so, the model is modified by changing blade stiffness and/or vane numbering until no data coincidences are present.